WHAT IS CLAIMED IS:

1. A method comprising:

providing a multi-port memory having a plurality of read ports, each read port including a filter coefficient value representing a dispersion compensation value associated with an optical link; and

processing an input optical signal using the filter coefficient values in the multi-port memory to generate an output optical signal for transmission on the optical link.

2. The method of claim 1, wherein the multi-port memory is a nine-port memory having eight read ports.

3. The method of claim 1, wherein processing the input optical signal comprises:

receiving the input optical signal;

sampling the input optical signal to provide an input data stream; and

applying the filter coefficient values to the input data stream to generate one or more output data streams.

4. The method of claim 3, wherein applying the filter coefficient values to the input data stream comprises:

identifying a first portion of the input data stream as an address to the multi-port memory;

retrieving a filter coefficient value from the multi-port memory using the address; and

adding the retrieved filter coefficient value to a second portion of the input data stream to generate an output data stream.

5. A digital filter comprising:

one or more functional units, each functional unit being associated with a lookup table of filter coefficient values, each functional unit to process an input data stream using the filter coefficient values in the lookup table and to generate one or more output data streams for transmission on an optical link.

6. The digital filter of claim 5, wherein the lookup table is a multi-port memory having a plurality of read ports, each read port storing a filter coefficient value.

7. The digital filter of claim 5, wherein each filter coefficient value represents a dispersion compensation value associated with the optical link.

8. The digital filter of claim 5, wherein each functional unit further comprises:

a linear adder tree to process a portion of the input data

stream, the linear adder tree including a plurality of adders, each adder having an input for receiving one of a first input sample value and a second input sample value, and an output for providing a partial sum.

9. The digital filter of claim 8, further comprising:

a final adder having a first input for receiving a final partial sum from a last one of the plurality of adders in the linear adder tree, a second input for receiving a filter coefficient value from the lookup table, and an output for providing a final sum.

10. A system comprising:

an optical transmission path having one or more optical links;

a transmit device including a dispersion compensation filter, the dispersion compensation filter associated with one or more lookup tables storing filter coefficient values, each filter coefficient value representing a dispersion compensation value associated with an optical link; and

a receive device coupled to the transmit device by the optical transmission path,

transmit device processes an input optical signal using the filter coefficient values to generate an output optical signal

for transmission to the receive device over an optical link of the optical transmission path.

11. The system of claim 10, wherein the transmit device further comprises:

a pre-encoder circuit to receive an input optical signal, sample the input optical signal and generate an input data stream.

12. The system of claim 10, wherein the dispersion compensation filter comprises:

one or more functional units, each functional unit for processing a bit of an input data stream.

13. The system of claim 12, wherein each functional unit comprises:

a linear processing component for processing a first portion of the input data stream to generate a linear component of a final sum representing a bit of the input data stream.

14. The system of claim 13, wherein the linear processing component comprises:

a linear adder tree including a plurality of adders, each adder having an input for receiving one of a first input

sample value and a second input sample value, and an output for providing the linear component of the final sum representing a bit of the input data stream.

15. The system of claim 12, wherein each functional unit comprises:

a non-linear processing component for processing a second portion of the input data stream to generate a non-linear component of the final sum representing a bit of the input data stream.

16. The system of claim 14, wherein the non-linear processing component comprises:

a multi-port memory having a plurality of read ports, each read port storing a filter coefficient value, wherein processing the second portion of the input data stream includes using the second portion of the input data stream as an address to the multi-port memory to retrieve a filter coefficient value.

17. The system of claim 12, wherein each functional unit comprises:

a final processing component for generating a final sum representing a bit of the input data stream.

18. A computer program product, tangibly embodied in an information carrier, the computer program product being operable to cause a machine to:

process an input optical signal using filter coefficient values stored in a multi-port memory to generate an output optical signal for transmission on an optical link, the multi-port memory having a plurality of read ports, each read port including a filter coefficient value representing a dispersion compensation value associated with the optical link.

19. The computer program product of claim 18, wherein the multi-port memory is a nine-port memory having eight read ports.

20. The computer program product of claim 18 being further operable to cause a machine to:

receive the input optical signal;

sample the input optical signal to provide an input data stream; and

apply the filter coefficient values to the input data stream to generate one or more output data streams.